GREYSTONE
ENGINEERING GROUP INC

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HYDROLOGY STUDY

January 22, 2025
APN 115-210-032
DPR2022-0016

Client:
NETZER ADMATI

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RCE: 84000

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Section 1 – Project Description

Project Description

The project involves the development of a new light manufacturing building located on S. Promenade Ave. Just past 6th St. (APN 115-210-032). The site, is 37,424 S.F. = 0.86 AC. The drainage would be directed to low points where flow will be collected in proposed catch basins. The flow from the catch basins will be directed into an infiltration trench with overflow discharging to an existing storm drain catch basin (basin number B3894 per City of Corona GIS maps and data) off the North East side of the property.

Purpose of the Study

The purpose of this report is to provide hydrologic and hydraulic study to compare generated storm water runoff for pre-construction vs post-construction and to verify capacity of existing storm drain system. This study will calculate the 10-year and 100-year storm discharges together with the BMP sizing calculations.

Land Use

The Existing use is manufacturing/industrial and the Planned land use is light manufacturing.

Pre-Development Conditions
The existing site is a vacant lot with pervious surface only.
The existing site is nearly flat with a slight slope towards the northerly direction.
The site is surrounded:
on the West side by APN – 115-210-009 sloping away from the site in question
on the South side by APN 115-210-031 sloping away from the site in question
on the East side by South promenade Ave sloping away from the site in question
As all surrounding properties and roads flow away from the property, this project will **not** absorb any flow from surrounding sites or roads.

Post-Development Conditions
The proposed development would include a new light manufacturing building and parking lot, with impervious surfaces.
Total Lot Area = 37,424 S.F. = 0.86 ac
Impervious Area (lf=1)= 28,243 s.f.
Pervious Area (lf=0.15)= 9,181 s.f.
lf1= (28,243x1+9,181X0.15)/37,424=0.79

The flow along S. Promenade Ave. will be directed to the existing curb & gutter and directed southernly, there is no change to the flow along S. Promenade Ave.

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Section 2 – Hydrology Section

This section describes the design criteria and methodology applied during hydrologic analysis of the project site. The design criteria and methodology used are from the Riverside County Flood Control and Water Conservation District Hydrology Manual.

3.1 Rational Method Hydrology

Runoff calculations for this study were accomplished using the Rational Method. The Rational Method is a physically-based numerical method where runoff is assumed to be directed proportional to rainfall and area, less losses for infiltration and depression storage. Flows were computed based on the Rational formula:

$$Q=CIA$$

Where…   Q=   peak discharge (cfs);
C=   runoff coefficient, based on land
use and soil type;
I=   rainfall intensity (in/hr);
A=   watershed area (acre)

The proposed project consists of 1 lot of approximately 0.86 ac and is located on Promenade Ave. Just past 6th St. The proposed site improvements will include construction of a new light manufacturing building building and a new parking lot, including paved driveway, walkways and loading area, with pervious surfaces.

The general drainage pattern of the new development will be taken by flow to catch basins located throughout the property at low points and will be directed into an infiltration trench at the north of the property, discharging into an existing storm drain along Promenade Ave. (See appendix 5, exhibit 12).

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DMA 1 EXISTING:

Total Tributary Drainage Area = 37,424 s.f. = 0.86 ac

Impervious area = 0 s.f.

Pervious Area = 37,424 s.f.

Length of Flow path, L=449'
The difference in elevation between ends of flow path, H= 848.8 – 845 = 3.8'

FROM FIGURE D-3, RCFC & WCD (appendix 2, exhibit 4), TIME OF CONCENTRATION Tc=15.5

10 yr. event:

A_i = Impervious area (actual) – decimal percent = **0.00**
A_p = Pervious area (actual) – decimal percent = 1.00-Ai = **1.00**
I = Rainfall intensity inches/hour (from Figure D-4.1 appendix 2, exhibit 5) = I_{10} = **1.77 in/hr**
F_p = Infiltration rate for pervious areas (inches/hr) = **0.15** (for natural B soil)

C= $0.9[A_i + ((I - F_p)/I) A_P] = 0.9[0+((1.77-0.15)/1.77) 1] =$**0.82**

Q_{10pre} = runoff in cubic feet per second (cfs)=CIA = 0.82*1.77*0.86 = **1.24 cfs**

100 yr. event:

A_i = Impervious area (actual) – decimal percent = **0.00**
A_p = Pervious area (actual) – decimal percent = 1.00-Ai = **1.00**
I = Rainfall intensity – inches/hour (from Figure D-4.1 appendix 1, exhibit 4) = I_{100} = **2.73 in/hr**
F_p = Infiltration rate for pervious areas (inches/hr**) = 0.15** (for natural B soil appendix 2, exhibit 3)

C= $0.9[A_i + ((I - F_p)/I) A_P] = 0.9[0+((2.73-0.15)/2.73) 1] =$**0.85**

Q_{100pre} = runoff in cubic feet per second (cfs)=CIA = 0.85*2.73*0.86 = **2.00 cfs**

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DMA 1 PROPOSED:

Total Area = 32,352 s.f. = 0.75 ac

Impervious Area (lf=1) = 28,243 s.f.

Pervious Area (lf=0.15) = 4,109 s.f.

Length of initial area, L=449'
The difference in elevation between ends of initial area, H=848.8 – 845 = 3.8'

FROM FIGURE D-3, RCFC & WCD, TIME OF CONCENTRATION (appendix 2, exhibit 4)
Tc=9

10 yr. event:

A_i = Impervious area (actual) – decimal percent = 28,234/32,352 = **0.87**
A_p = Pervious area (actual) – decimal percent = 1.00-0.87= **0.13**
I = Rainfall intensity – inches/hour (from Figure D-4.1 appendix 2, exhibit 5) = I_{10} = **2.34 in/hr**
F_p = Infiltration rate for pervious areas (inches/hr) = **0.15** (for natural B soil; appendix 2, exhibit 3)

$C= 0.9[A_i +((I - F_p)/I) A_P]=0.9[0.87+((2.34-0.15)/2.34) 0.13]=$**0.89**

Q_{10post} = runoff in cubic feet per second (cfs)=CIA = 0.89*2.34*0.75 = **1.56 cfs**

100 yr. event:

A_i = Impervious area (actual) – decimal percent = 28,234/32,352 = **0.87**
A_p = Pervious area (actual) – decimal percent = 1.00-0.87 = **0.13**
I = Rainfall intensity – inches/hour (from Figure D-4.1 appendix 1) = I_{100} = **3.60 in/hr**
F_p = Infiltration rate for pervious areas (inches/hr) = **0.15** (for natural B soil)

$C= 0.9[A_i +((I - F_p)/I) A_P]=0.9[0.87+((3.60-0.15)/3.60) 0.13]=$**0.90**

$Q_{100post}$ = runoff in cubic feet per second (cfs)=CIA = 0.90*3.60*0.75 = **2.43 cfs**

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INFILTRATION TRENCH PROPOSED:

Infiltration Rate = 3.4 in/hr

Converted Infiltration Rate to ft/sec= Infiltration Rate x 1'/12" x 1hr/3600 sec = 3.4in/hr x 1'/12" x 1hr/3600 sec = 3.4/ (12*3600) = 3.4 / 43,200 = **0.0000787 ft/sec**

Design Rate = Converted Infiltration Rate / FS = 0.0000787/3 = **0.00003 ft/sec**

Infiltration Area = (Infiltration Depth * (Infiltration Trench Side 1+Side 2+Side3+Side4))+ (Infiltration Trench square footage)=(6*(23.5+50.42+50.42+5.42))+740=(6*129.76)+740 =778.56+740=1,518.56 = **1,519 s.f.**

Disposal Rate = Design Rate x Infiltration Area =0.00003 ft/sec x 1,519 s.f.= **0.045 cf/sec**

Disposal Volume Per 48 hrs = Disposal Rate x 48hrs x 3600 sec/hr=0.045 cf/sec x 48hrs x 3600 sec/hr= **7,776 cf**

$Q_{infiltration}$ = Disposal Volume PER 48 hrs (CF) / (48 hrs x 60 min x 60 sec) =

7,776 cf / (48 hrs x 60 min x 60 sec) = 7,776 cf/172,800 sec = **0.045 cf/sec**

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Storm Drain System Capacity:

Storm Water Mitigation Changes:

Q_{100pre} = 2.00 cfs

$Q_{100post}$ = 2.43 cfs

$Q_{infiltration}$ = 0.045 cfs

Stormwater to be mitigated in 100 year event post construction:

Storm mitigation post = $Q_{100post}$ – $Q_{infiltration}$ = 2.43 cfs – 0.045 cfs = **2.38 cfs**

Difference in Stormwater mitigation pre – post:

Difference = Storm mitigation post – Q_{100pre} = 2.38 cfs – 2.00 cfs = **0.38 cfs**

Existing Stormwater System Capacity:

Per Appendix 2 exhibit 6

Existing Storm Line Pipe Diameter (DIA)= 42" DIA

Existing Storm Line Pipe Length (Length)= 184.437 ft

Upstream Inv. Elevation = 643.24

Downstream Inv. Elevation = 642.4

Existing Storm Line Pipe Slope (SLOPE)= Up – down / Length = 643.24-642.24 / 184.437 = 0.005 = **0.54%**

Existing Storm Line Pipe Capacity (CAP)= Per D-8.1 Appendix 2 exhibit 7= **11 cfs**

Stormwater System Capacity Study:

Existing Storm Line Pipe Capacity = 11 cfs

Additional Capacity Added to System (Difference) = 0.38 cfs

Percentage of added volume = 0.38/11 = **0.03%**

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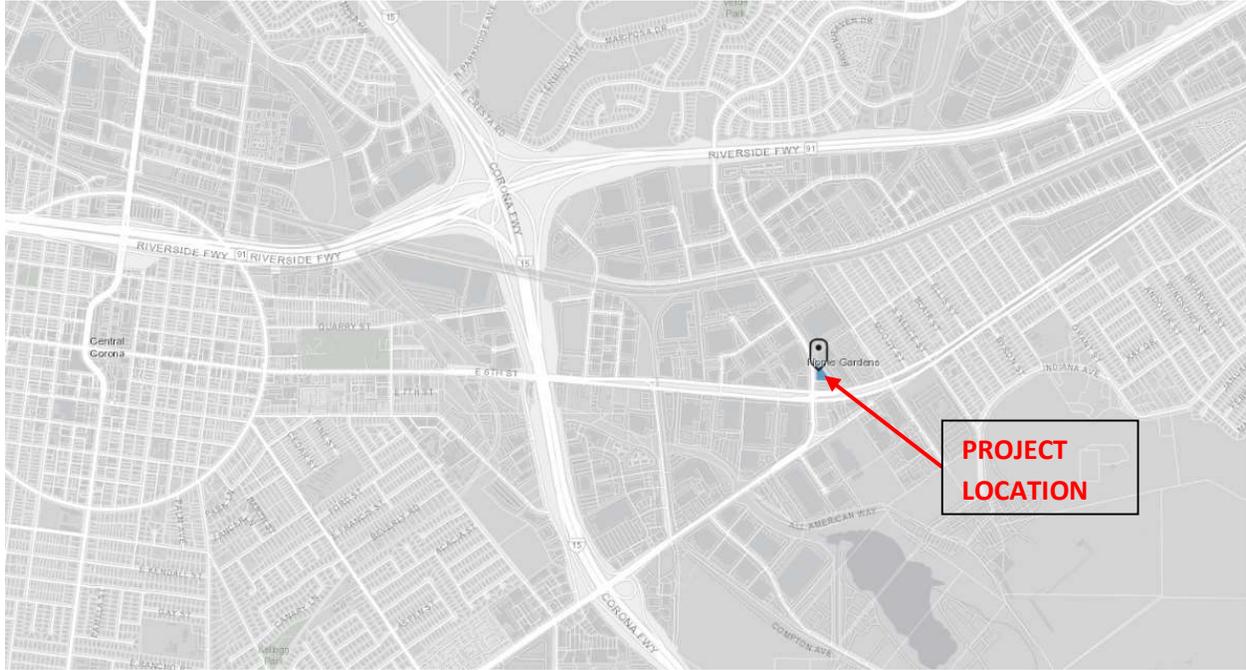
7

Conclusion

The general drainage pattern of the new development will be to catch basins at all low points throughout the property, taken via underground pipes to the infiltration trench at the Northeast of the property. The infiltration trench would treat the 85th percentile of the storm event, with overflow discharging to the existing storm drain basin along S. Promenade Ave. at the Northeast of the property.

The proposed development will increase the impervious area of the project site by 28,243 s.f. This increase to the impervious area will cause an increased stormwater runoff volume of 0.38 cfs. Per the aforementioned calculations this is a less than 5% increase into the existing storm water system draining along S. Promenade Ave and is therefore negligible.
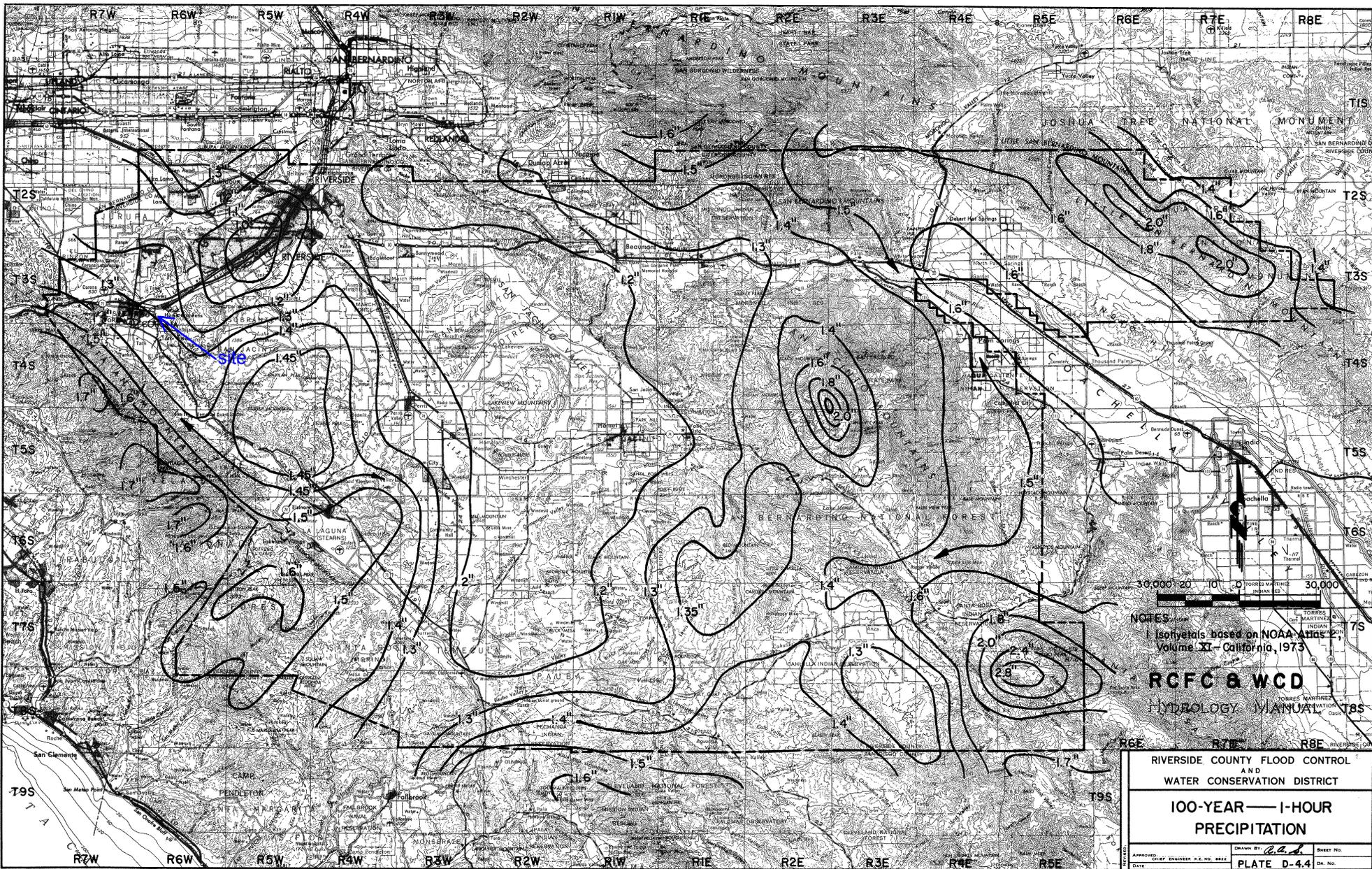
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APPENDIX 1
VICINITY MAP
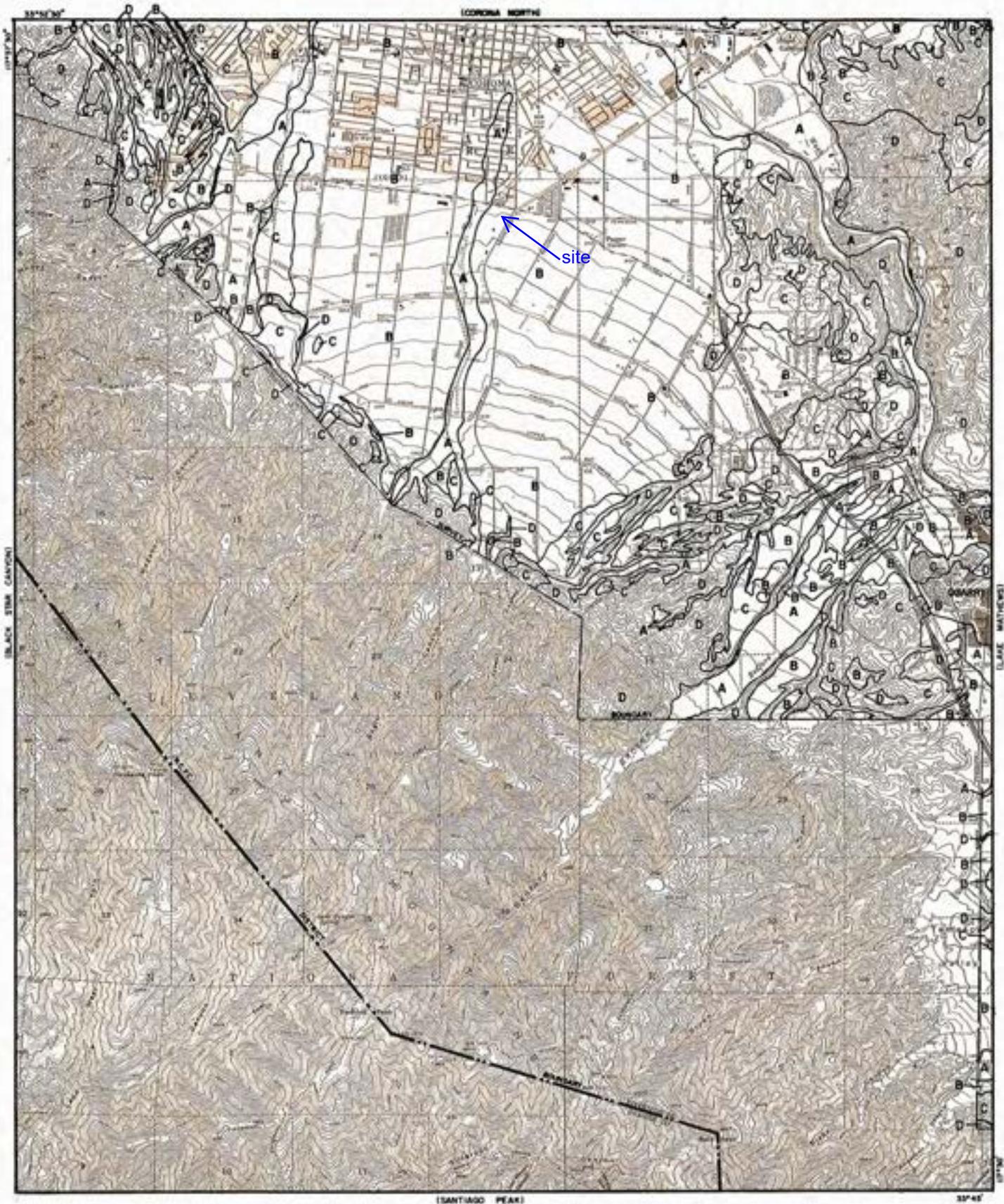
VICINITY MAP

PROJECT
LOCATION

NTS

EXHIBIT 1

APPENDIX 2
HYDROLOGY MANUAL PLATES

RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

100-YEAR — 1-HOUR
PRECIPITATION

NOTES:
1 Isohyetals based on NOAA Atlas 2,
Volume XI — California, 1973

RCFC & WCD
HYDROLOGY MANUAL

PLATE D-4.4

EXHIBIT 2

site

LEGEND

— SOILS GROUP BOUNDARY
A SOILS GROUP DESIGNATION

RCFC&WCD
HYDROLOGY MANUAL

N

0   FEET   5000

HYDROLOGIC SOILS GROUP MAP
FOR
CORONA—SOUTH

(SANTIAGO PEAK)

PLATE C—1.27

EXHIBIT 3

LIMITATIONS:
1. Maximum length = 1000'
2. Maximum area = 10 Acres

L — Length (L) of initial area in feet

Tc' — Time of concentration (Tc') in minutes for special development

Development or Zoning (K)

Percentage of Impervious Cover (Ai)

H — Difference in elevation (H) in feet between ends of initial area

Tc — Time of concentration (Tc) in minutes for Single Family Development (1/4 Acre)

K / **Ai**

Undeveloped Good Cover	0
Undeveloped Fair Cover	0
Undeveloped Poor Cover	0
Single Family (1/4 Acre)	50
Commercial (Paved)	90

PROPOSED

EXISTING

KEY
L→H→Tc→K→Tc'

EXAMPLE:

(1) L = 550', H = 5.0', K = Single Family (1/4 Ac.) Development, Tc = 12.6 min.

(2) L = 550', H = 5.0', K = Commercial Development, Tc = 9.7 min.

DMA A-1

Reference: Bibliography item No. 35.

RCFC & WCD
HYDROLOGY MANUAL

TIME OF CONCENTRATION

FOR INITIAL SUBAREA

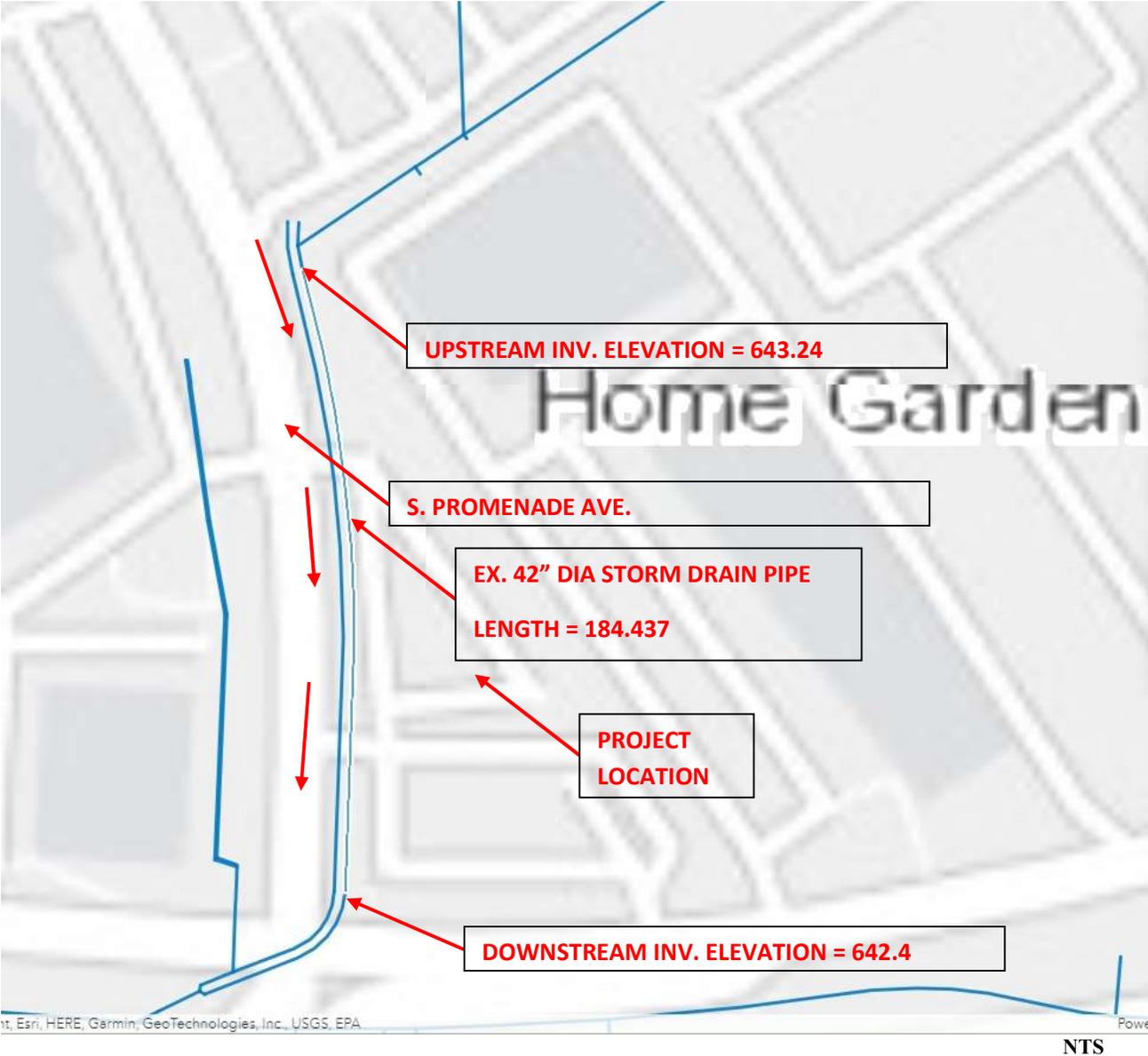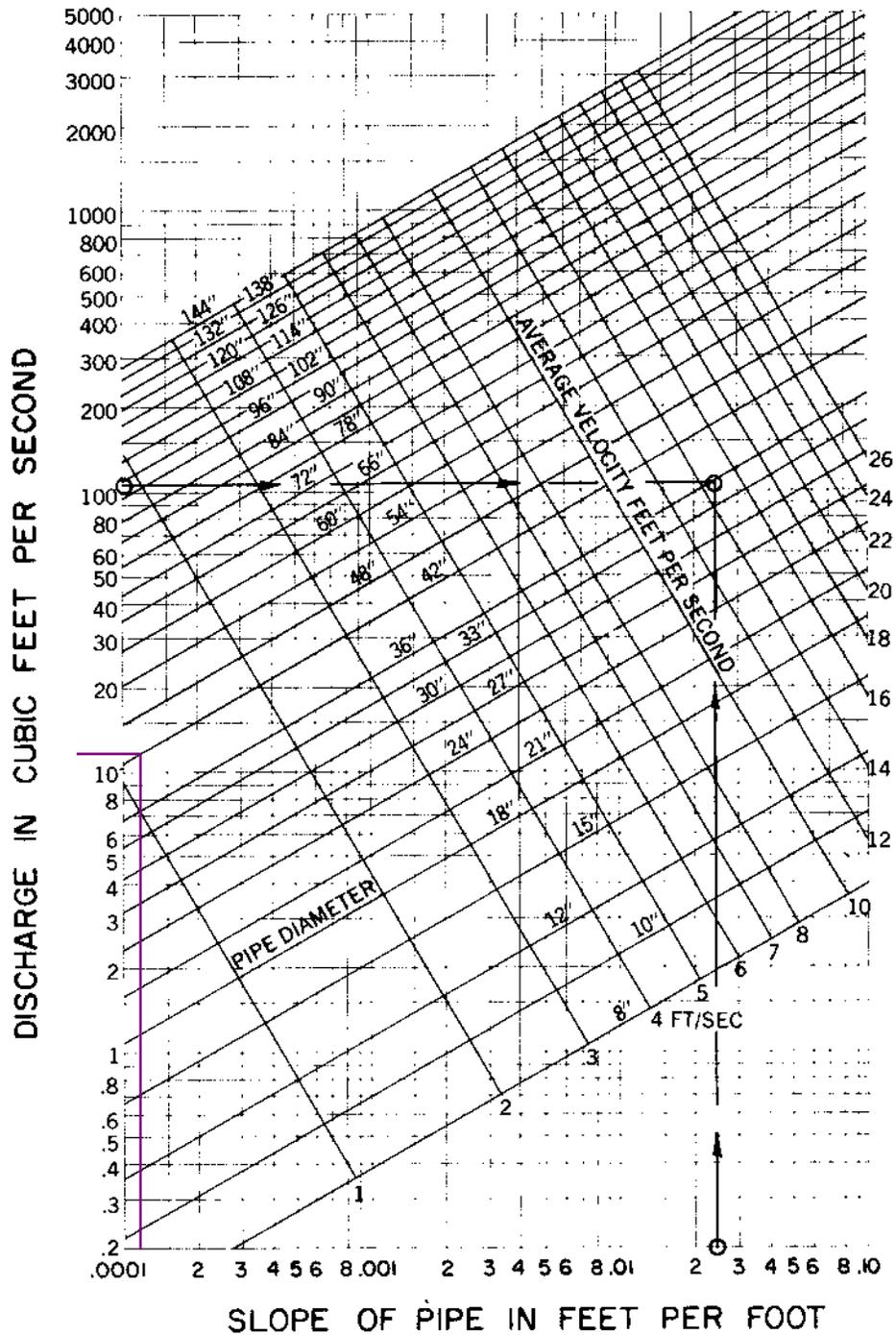# RAINFALL INTENSITY—INCHES PER HOUR

CATHEDRAL CITY			CHERRY VALLEY			CORONA			DESERT HOT SPRINGS			ELSINORE – WILDOMAR		
DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY	
	10 YEAR	100 YEAR		10 YEAR	100 YEAR		10 YEAR	100 YEAR		10 YEAR	100 YEAR		10 YEAR	100 YEAR
5	4.14	6.76	5	3.65	5.49	5	3.10	4.78	5	4.39	6.76	5	3.23	4.94
6	3.73	6.08	6	3.30	4.97	6	2.84	4.38	6	3.95	6.08	6	2.96	4.53
7	3.41	5.56	7	3.03	4.56	7	2.64	4.07	7	3.62	5.56	7	2.75	4.21
8	3.15	5.15	8	2.82	4.24	8	2.47	3.81	8	3.35	5.15	8	2.58	3.95
9	2.95	4.81	9	2.64	3.97	9	2.34	3.60	9	3.13	4.81	9	2.44	3.73
10	2.77	4.52	10	2.49	3.75	10	2.22	3.43	10	2.94	4.52	10	2.32	3.54
11	2.62	4.28	11	2.36	3.56	11	2.12	3.27	11	2.78	4.28	11	2.21	3.39
12	2.49	4.07	12	2.25	3.39	12	2.04	3.14	12	2.65	4.07	12	2.12	3.25
13	2.38	3.88	13	2.16	3.25	13	1.96	3.02	13	2.53	3.88	13	2.04	3.13
14	2.28	3.72	14	2.07	3.12	14	1.89	2.92	14	2.42	3.72	14	1.97	3.02
15	2.19	3.58	15	1.99	3.00	15	1.83	2.82	15	2.32	3.58	15	1.91	2.92
16	2.11	3.44	16	1.92	2.90	16	1.77	2.73	16	2.24	3.44	16	1.85	2.83
17	2.04	3.32	17	1.86	2.80	17	1.72	2.66	17	2.16	3.32	17	1.80	2.75
18	1.97	3.22	18	1.80	2.71	18	1.68	2.58	18	2.09	3.22	18	1.75	2.67
19	1.91	3.12	19	1.75	2.64	19	1.63	2.52	19	2.03	3.12	19	1.70	2.60
20	1.85	3.03	20	1.70	2.56	20	1.59	2.46	20	1.97	3.03	20	1.66	2.54
22	1.75	2.86	22	1.61	2.43	22	1.52	2.35	22	1.86	2.86	22	1.59	2.43
24	1.67	2.72	24	1.54	2.32	24	1.46	2.25	24	1.77	2.72	24	1.52	2.33
26	1.59	2.60	26	1.47	2.22	26	1.40	2.17	26	1.69	2.60	26	1.46	2.24
28	1.52	2.49	28	1.41	2.13	28	1.36	2.09	28	1.62	2.49	28	1.41	2.16
30	1.46	2.39	30	1.36	2.05	30	1.31	2.02	30	1.55	2.39	30	1.37	2.09
32	1.41	2.30	32	1.31	1.98	32	1.27	1.96	32	1.50	2.30	32	1.33	2.03
34	1.36	2.22	34	1.27	1.91	34	1.23	1.90	34	1.45	2.22	34	1.29	1.97
36	1.32	2.15	36	1.23	1.85	36	1.20	1.85	36	1.40	2.15	36	1.25	1.92
38	1.28	2.09	38	1.20	1.80	38	1.17	1.81	38	1.36	2.09	38	1.22	1.87
40	1.24	2.02	40	1.16	1.75	40	1.14	1.76	40	1.32	2.02	40	1.19	1.82
45	1.16	1.89	45	1.09	1.64	45	1.08	1.66	45	1.23	1.89	45	1.13	1.72
50	1.09	1.78	50	1.03	1.55	50	1.03	1.58	50	1.16	1.78	50	1.07	1.64
55	1.03	1.68	55	.99	1.47	55	.98	1.51	55	1.09	1.68	55	1.02	1.56
60	.98	1.60	60	.93	1.40	60	.94	1.45	60	1.04	1.60	60	.98	1.50
65	.94	1.53	65	.89	1.34	65	.90	1.40	65	.99	1.53	65	.94	1.44
70	.90	1.46	70	.85	1.29	70	.87	1.35	70	.95	1.46	70	.91	1.39
75	.86	1.41	75	.82	1.24	75	.84	1.30	75	.91	1.41	75	.88	1.35
80	.83	1.35	80	.79	1.20	80	.82	1.26	80	.88	1.35	80	.85	1.31
85	.80	1.31	85	.77	1.16	85	.80	1.23	85	.85	1.31	85	.83	1.27
SLOPE = .580			SLOPE = .550			SLOPE = .480			SLOPE = .580			SLOPE = .480		

EXHIBIT 5

EXISTING STORM DRAIN PIPE

UPSTREAM INV. ELEVATION = 643.24

Home Garden

S. PROMENADE AVE.

EX. 42" DIA STORM DRAIN PIPE

LENGTH = 184.437

PROJECT LOCATION

DOWNSTREAM INV. ELEVATION = 642.4

NTS

EXHIBIT 6

BASED ON MANNING'S EQUATION n=0.013

EXAMPLE:

Given Q = 105 cfs and S = 2.5 % find required pipe
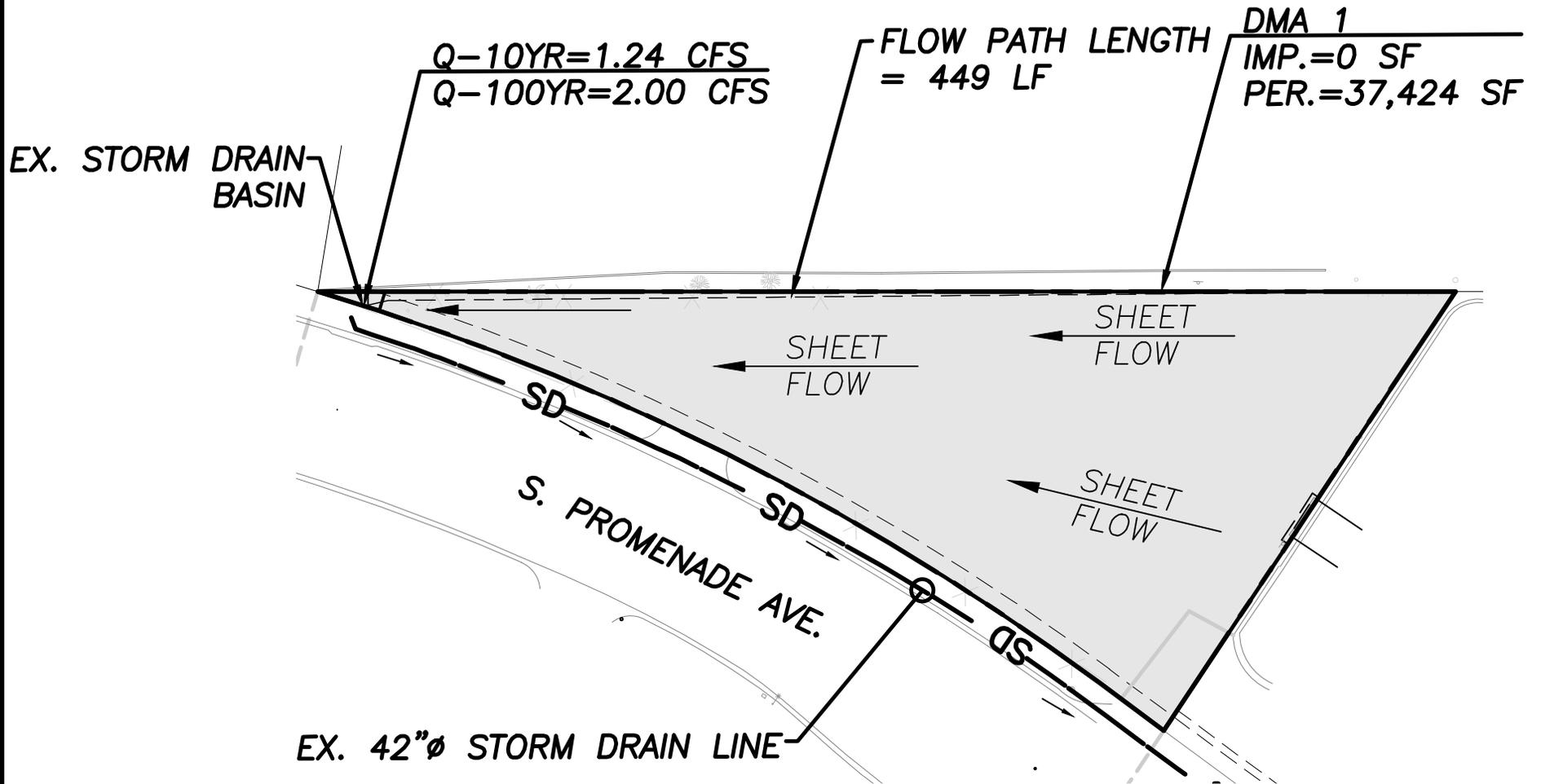size and velocity. From curves required Size = 36"φ
and Velocity = 14.8 fps

Reference: Bibliography item No. 10.

RCFC & WCD

HYDROLOGY MANUAL

VELOCITY DISCHARGE CURVE
CIRCULAR CONCRETE PIPES
FLOWING FULL

APPENDIX 3
HYDROLOGY MAPS

HYDROLOGY MAP
PRE-CONSTRUCTION

Q-10YR=1.24 CFS
Q-100YR=2.00 CFS

FLOW PATH LENGTH
= 449 LF

DMA 1
IMP.=0 SF
PER.=37,424 SF

EX. STORM DRAIN BASIN

SHEET FLOW

SHEET FLOW

SHEET FLOW

SD

SD

SD

S. PROMENADE AVE.

EX. 42"ø STORM DRAIN LINE

EXHIBIT 8

NTS

HYDROLOGY MAP
POST-CONSTRUCTION

Q-10YR=1.56 CFS
Q-100YR=2.43 CFS

FLOW PATH LENGTH
= 449 LF

DMA 1
IMP.=28,243 SF
PER.=4,109 SF

EX. STORM DRAIN BASIN

PROP. INFILTRATION TRENCH

SD

S. PROMENADE AVE.

SD

SD

EX. 42"Ø STORM DRAIN LINE
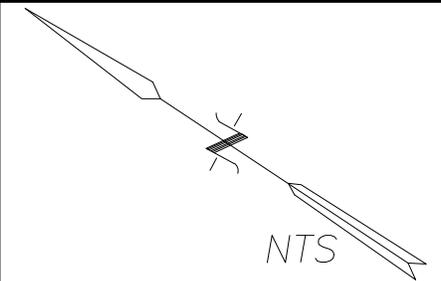
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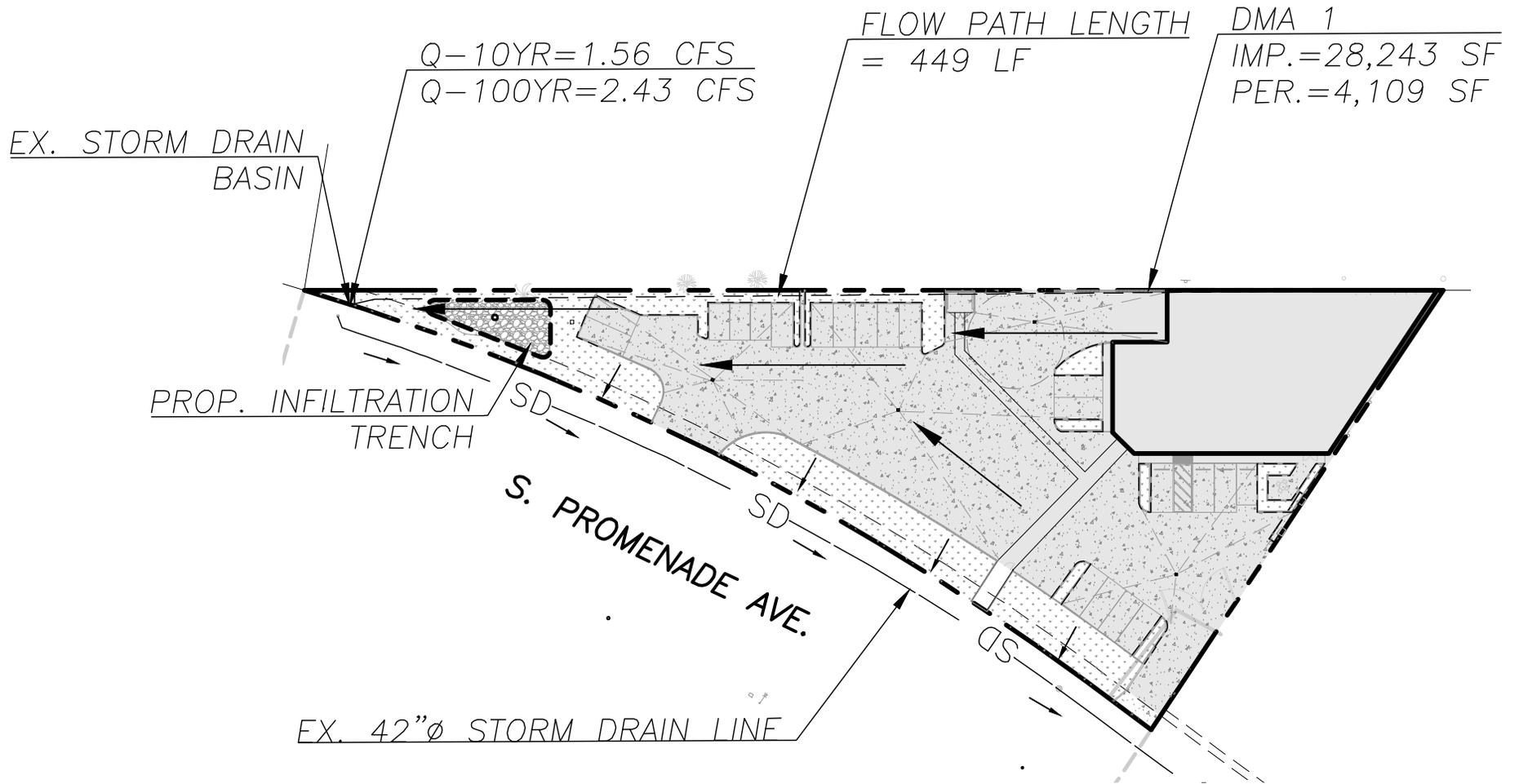
GREYSTONE
ENGINEERING GROUP INC
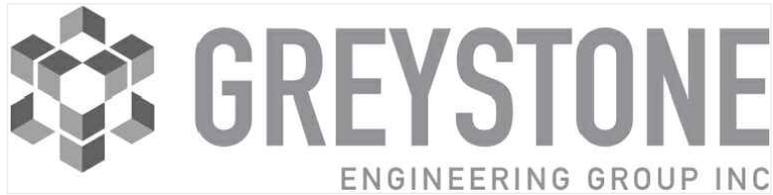
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(310) 405-2341 EMAIL: INFO@GREYSTONEENG.COM

EXHIBIT 9

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APPENDIX 4
BMP DESIGN FLOW CALCULATIONS

Santa Ana Watershed - BMP Design Volume, V$_{BMP}$

(Rev. 10-2011)

Legend:	Required Entries
	Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	GREYSTONE ENGINEERING INC	Date	
Designed by	HV	Case No	
Company Project Number/Name	CORONA		

BMP Identification

BMP NAME / ID INFILTRATION TRENCH

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

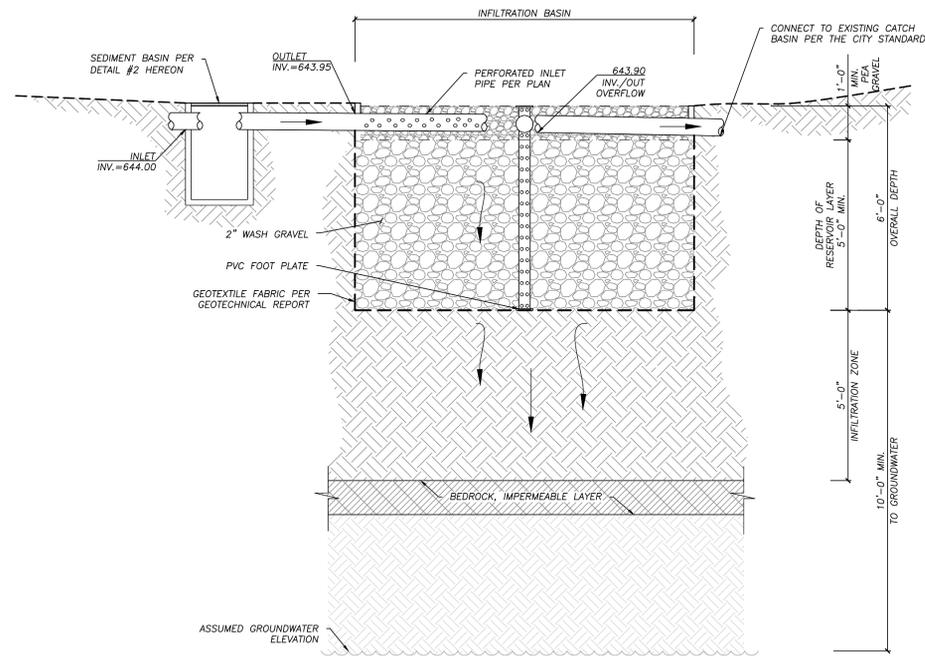85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85} = 0.70 inches
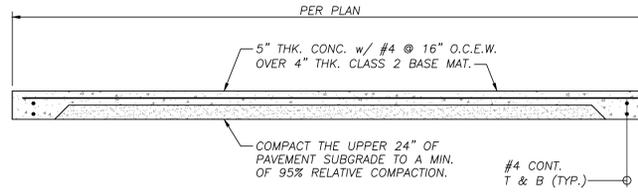
Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I$_f$	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V$_{BMP}$ (cubic feet)	Proposed Volume on Plans (cubic feet)
A1	28243	Mixed Surface Types	1	0.89	25192.8			
28243		**Total**			**25192.8**	**0.70**	**1469.6**	**1525**

Notes:

EXHIBIT 10

DETAIL NO. 1 INFILTRATION TRENCH
N.T.S.

INFILTRATION BASIN

SEDIMENT BASIN PER DETAIL #2 HEREON

OUTLET INV.=643.95

CONNECT TO EXISTING CATCH BASIN PER THE CITY STANDARD

INLET INV.=644.00

PERFORATED INLET PIPE PER PLAN

643.90 INV./OUT OVERFLOW

1'-0" MIN. PEA GRAVEL

2" WASH GRAVEL

PVC FOOT PLATE

GEOTEXTILE FABRIC PER GEOTECHNICAL REPORT

DEPTH OF RESERVOIR LAYER 5'-0" MIN.

6'-0" OVERALL DEPTH

5'-0" MIN. INFILTRATION ZONE

10'-0" MIN. TO GROUNDWATER

BEDROCK, IMPERMEABLE LAYER

ASSUMED GROUNDWATER ELEVATION

DETAIL NO. 2 CONCRETE DRIVEWAY
N.T.S.

PER PLAN

5" THK. CONC. w/ #4 @ 16" O.C.E.W. OVER 4" THK. CLASS 2 BASE MAT.

COMPACT THE UPPER 24" OF PAVEMENT SUBGRADE TO A MIN. OF 95% RELATIVE COMPACTION.

#4 CONT. T & B (TYP.)
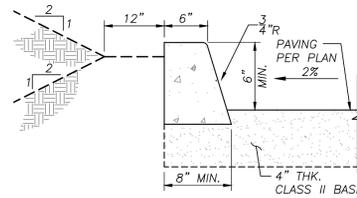
DETAIL NO. 3 CONCRETE CURB
N.T.S.

12" 6"

3"R

PAVING PER PLAN 2%

6" MIN.

8" MIN.

4" THK. CLASS II BASE

DETAIL NO. 4 CATCH BASIN
N.T.S.

1818 CAST IRON GRATE
PARKWAY ONLY   58 lbs.

1818 STEEL GRATES
PARKWAY   27 lbs.
TRAFFIC   49 lbs.

1818 STEEL COVER
PARKWAY   44 lbs.
TRAFFIC   65 lbs.

20 1/8" 20 1/8" 1 3/4"

20 5/8" 20 5/8" 1 3/4"

1818 TOP SECTION (WITH GALVANIZED FRAME)

SEE CHART

18"

28" 28"

1818 LOWER SECTION (NO FRAME)
NOTE: USE 12", 18", 24" LOWERS TO INCREASE DEPTH UP TO A MAXIMUM OF 72"

SEE CHART

18"

28" 28"

NOTES:
1. GRATES AND COVERS AVAILABLE PAINTED BLACK OR GALVANIZED
2. "ADA" GRATES AVAILABLE IN PARKWAY & TRAFFIC
3. "HEEL PROOF" GRATES AVAILABLE IN PARKWAY & TRAFFIC
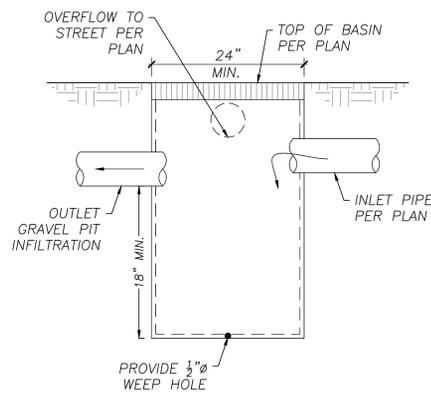4. A TOP SECTION WITH FRAME MUST BE USED IF BOLT DOWN REQUIRED

1818 BASE
WT. 270 lbs

28" 28" 4"

TOP SECTION	HT.	LBS	KNOCK-OUT
1818 T6	6"	215	NONE
1818 T12	12"	370	(4) 5" x 10"
1818 T18	18"	555	(4) 9" x 11"
1818 T24	24"	785	(4) 9" x 11"

EXTENSION SECTION	HT.	LBS	KNOCK-OUT
1818 E6	6"	215	NONE

LOWER SECTION	HT.	LBS	KNOCK-OUT
1818 L12	12"	370	(4) 5" x 10"
1818 L18	18"	555	(4) 9" x 11"
1818 L24	24"	785	(4) 9" x 11"

JENSEN PRECAST EST. 1968

18" x 18" CATCH BASIN

ORIG. DWG. DATE	REV. DWG. DATE
04-20-95	02-14-20

7.04

BROOKS 1818 CB

DETAIL NO. 5 SEDIMENT BASIN
N.T.S.

OVERFLOW TO STREET PER PLAN

TOP OF BASIN PER PLAN

24" MIN.

OUTLET GRAVEL PIT INFILTRATION

INLET PIPE PER PLAN

18" MIN.

PROVIDE ½"Ø WEEP HOLE

APPENDIX 5
DRAINAGE PLAN

PT-2
5/23/24

PT-3
8/02/24

LANDSCAPE AREA

PL

PT-1
1/7/22

PROPOSED
PARKING

DS

DS

LIGHT MANUFACTURING
TOTAL 10,000 S.F.

PROPOSED
BUILDING

CB

LANDSCAPE AREA

PROMENADE AVE.

PL

CB

PL

Farmer Boys - Restaurant

20 16 12 8 4 0   20   40 Feet

Graphic Scale
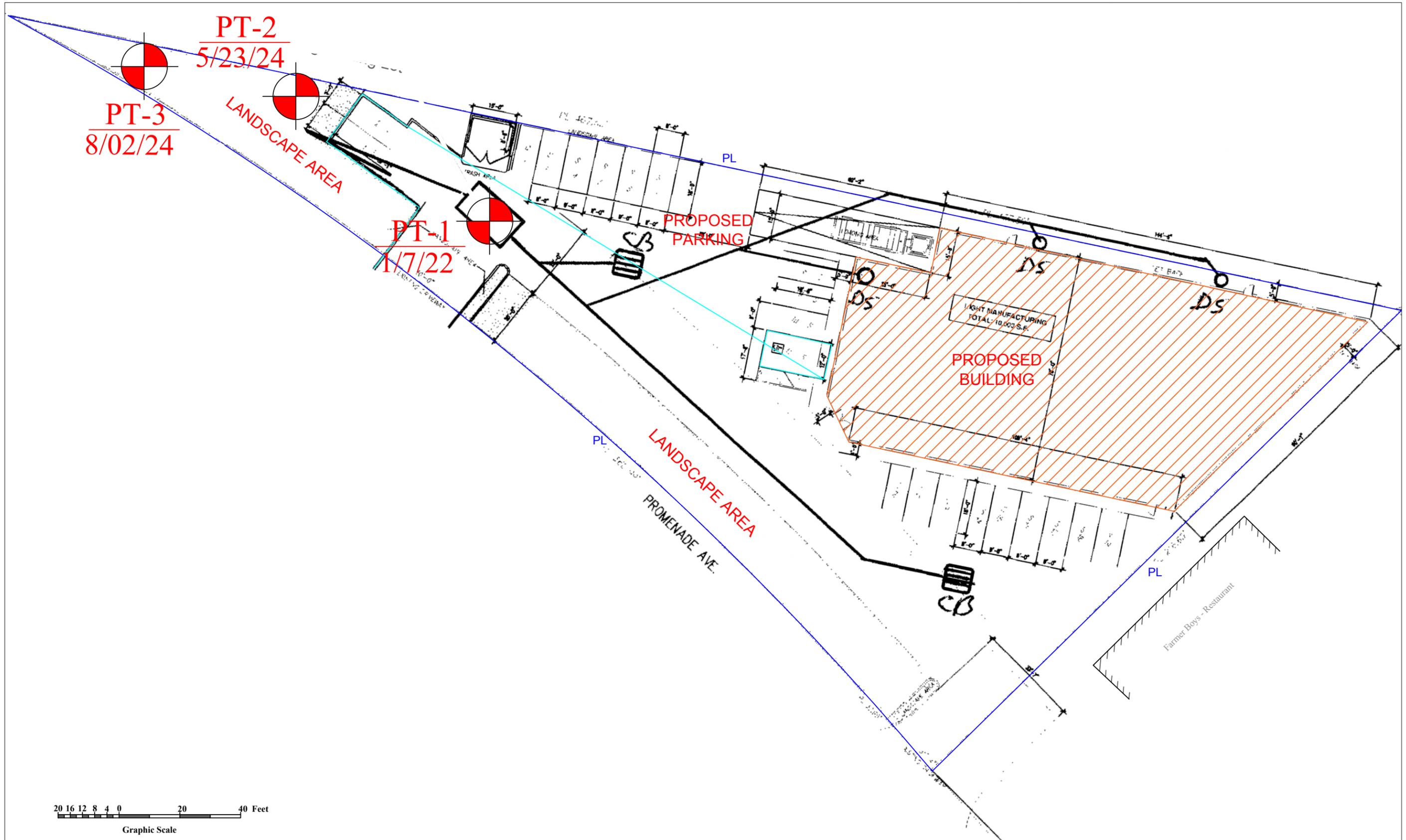
LEGEND

⊕ Percolation Test Location

soil PACIFIC Inc.
Geotechnical & Environmental Services

**675 N. Eckhoff, Suite # A
Orange, CA 92868**

Project Location:
NE Corner of 6th St. and
Promenade Ave., Corona.CA

GEOTECHNICAL PLAN

FIGURE-A-1-1 | PROJECT NO.:A-3388UP-24

DATE :8/02/2024 | SCALE: 1"=30'

PROPOSED INFILTRATION TRENCH
PER DETAIL 1/WQMP-1
AREA REQ.=740 SQ.FT.
AREA PROVIDED =745 SQ.FT.
RIM=644.50
INLET INV.= 644.00
BOTT.=638.00
INV. OUT=644.00

NOT-A-PART

PROPOSED TRASH ENCLOSURE

PROPOSED LOADING DOCK

CONNECT TO EXISTING
CATCH BASIN PER THE
CITY STANDARD

6"ø Overflow Pipe

644.00
INV./IN

648.40

SHEET
FLOW

PA 647.42

PA

PA

647.34

647.37

646.96
FS

647.70

648.20

6"CF

647.07

18'-0" TYP.

647.60
FS

PROPOSED LIGHT MANUFACTURING
BUILDING
FF=648.50
FG=647.83

648.40 OS

648.40

9'-0"
TYP.

646.48
FS

647

648.50
648.40
648.20

EX. (44'-0")

646.00 TG
644.42 INV.

PROPOSED
WROUGHT IRON
GATE PER
ARCH. PLANS

647.30
FS

647

647.60
FS

647.60 FS 8.33%

648.45
FS

648.50
FS

DMA1

32,352 SF

A2

4,109 SF

EX. 8" HIGH CURB & 2'-0"
WIDE GUTTER TO REMAIN

646.00 TG
644.81 INV.

6"ø PVC PIPE

647.73
FS

648 FG

RAMP 1.5%

6"ø PVC PIPE

PATH OF
TRAVEL

647.90

647.50
FS

EX. 30"ø WATER MAIN
LINE TO REMAIN

PROPOSED CONC. DRWY
& PARKING LOT

647.22

S. PROMENADE AVE.

EX. 10"ø WATER LINE
TO REMAIN

EX. 42"ø STORM DRAIN
MAIN LINE TO REMAIN

PATH OF
TRAVEL

647.85

PROPOSED F.H. PER
SEP. PLAN & PERMIT

647.60
6"CF

646.50

A1

28,243 SF

PROP. WATER LATERAL

FUTURE FIRE
SERVICE

647.26
FS

646.80
FS

646.50
6"CF

EX. 8" HIGH CURB & 2'-0"
WIDE GUTTER TO REMAIN

NOT-A-PART

EX. 4"ø SEWER
PIPE TO REMAIN

PROPOSED F.H. PER SEP. PLAN
& PERMIT APPROX. 280' FROM
EXISTING F.H. ON 6TH ST.

(641.30
EX. INV.)

(647.26
FS)

WQMP PLAN
1:16

DETAIL NO. 1 INFILTRATION TRENCH
N.T.S.

INFILTRATION BASIN

SEDIMENT BASIN PER
DETAIL #2 HEREON

OUTLET
INV.=643.95

643.90
INV./OUT
OVERFLOW

CONNECT TO EXISTING CATCH
BASIN PER THE CITY STANDARD

PERFORATED INLET
PIPE PER PLAN

PEA GRAVEL

INLET
INV.=644.00

2" WASH GRAVEL

PVC FOOT PLATE

GEOTEXTILE FABRIC PER
GEOTECHNICAL REPORT

DEPTH OF
RESERVOIR LAYER
5'-0" MIN.

6'-0" OVERALL DEPTH

5'-0" MIN.
INFILTRATION ZONE

BEDROCK, IMPERMEABLE LAYER

10'-0" MIN.
TO GROUNDWATER

ASSUMED GROUNDWATER
ELEVATION

NOTE: ALL SLOPES TO BE VEGETATED

NOTE:
ANY CHANGES (TYPE, SIZE, LOCATION) TO APPROVED
STORMWATER BEST MANAGEMENT PRACTICE(S) (BMP's)
MUST OBTAIN WRITTEN APPROVAL FROM LOS ANGELES,
DEPARTMENT OF PUBLIC WORKS, BUREAU OF
SANITATION PRIOR TO CONSTRUCTION OF BMP(s).

NOTE TO CONTRACTOR
CONTRACTOR TO VERIFY THE LOCATIONS OF ALL
PROPOSED STRUCTURES, ELEVATIONS, AND
DIMENSIONS PRIOR TO CONSTRUCTION. CONTRACTOR
TO CONTACT PROJECT ENGINEER OF ANY
DISCREPANCIES PRIOR TO ANY CONSTRUCTION.

NO DUMPING
THIS DRAINS TO OCEAN

DETAIL NO. 1
SCALE: NTS
STENCIL TO BE PAINTED NEAR
CATCH BASINS THAT DRAIN
INTO BMP DEVICES

SUB-AREA BOUNDARY

A1 SUB-AREA DESIGNATION

INDICATES PROPOSED
IMPERVIOUS AREA

SCALE: 1: 16
0   16   32   48

APPENDIX 6
INFILTRATION DATA

soil PACIFIC INC.

Geotechnical and Environmental Services

Mr. Netzar Admati
249 Warwick Avenue
South Pasadena, CA 91030

Subject: **Additional On-site Infiltration Testing**
                  Proposed Commercial Building
                  NE Corner of 6th Street and Promenade Avenue
                  APN 115210032, Corona, California

Dear Sir:

Pursuant to your request and inquiry, we are pleased to submit our design recommendation letter concerning the proposed on-site infiltration testing. This design recommendation is based on a newly tested on-site infiltration percolation test at a designated location by the project civil engineer.

In accordance with WQMP design recommendations a larger auger drill rig was used to perform a boring to a depth of -5 feet below the existing grade. Encountered soils at the proposed infiltration depth were mainly silty sand with some gravel.

On-site infiltration testing was performed between -1 to -5 feet below the existing grade. The calculated design rate of on-site infiltration basin is in the order of 3 .39 inches per hour including the factor of safety for the location of the tested area.

The opportunity to be of service is appreciated. Should any question arise concerning this clarification letter please contact this office for further clarification.

Respectfully submitted,

SOIL PACIFIC, INC.

Hoss Eftekhari
RCE

[Engineer's seal: REGISTERED PROFESSIONAL ENGINEER — HOSS EFTEKHARI — No. C50121 — EXP. 6/30/25 — CIVIL — STATE OF CALIFORNIA]

Porchet Method, Aka Inverse Borehole Method /LB

$\Delta T := 15$ Time Interval 50 Minutes

$D0 := 5$ Initial Depth to Water, (inch)

$Df := 55$ Final Depth to Water, (inch)

$Dr := 58$ Total Depth of the Test Hole

$r := 3$ Test Hole Redius, Inch

$H0 := Dr - D0$ Initial height of water at the selected time interval

$H0 = 53$

$Hf := Dr - Df$ Final height of water at the selected time interval

$Hf = 3$

$\Delta H := H0 - Hf$ $\Delta H = \Delta D$ Change in height over the time interval

$\Delta H = 50$

$$Havg := \frac{(H0 + Hf)}{2}$$

$Havg = 28$

The Conversion Equation is used:

$$IR := \frac{\Delta H \cdot (60 \cdot r)}{\Delta T \cdot (r + 2Havg)}$$

$IR = 10.169$ inch /Hour   Infiltration rate without including factor of safety

$FS := 3$

$$Infilt := \frac{IR}{FS}$$

$Infilt = 3.39$ Per Hour

soil PACIFIC INC.
Geotechnical and Environmental Services

Project No. A-3388-3-21
January 9, 2022

Mr. Netzar Admati
249 Warwick Avenue
South Pasadena, CA 91030

Subject: **Soil and Foundation Evaluation Report Update**
Proposed Commercial Building
NE Corner of 6th Street and Promenade Avenue
APN 115210032, Corona, California

Dear Sir:

Pursuant to your authorization, we are pleased to submit our report for the subject project. Our evaluation was conducted in January 2007. A supplementary boring was performed was performed in December 2008, to evaluate the deeper soil strata. These evaluations consisted of field exploration; sub-surface soil sampling; laboratory testing; engineering evaluation and preparation of the following report containing a summary of our conclusions and recommendations.

The opportunity to be of service is appreciated. Should any questions arise pertaining to any portion of this report, please contact this firm in writing for further clarification.

Very truly,

Soil Pacific Inc.

Dr. Yones Kabir
President

Hoss Eftekhari
RCE

[Professional Engineer stamp: REGISTERED PROFESSIONAL ENGINEER, HOSS EFTEKHARI, No. C50121, EXP. 6/30/23, CIVIL, STATE OF CALIFORNIA]

675 N. Eckhoff, Suite A, Orange, CA 92868   OTel. (714) 879-1205   OFax (714) 879-4812
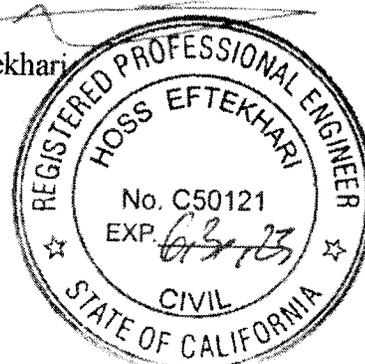
Soldier piles and anchors should be designed for the full anticipated pressures. Due to arching in the soils, the pressure on the lagging will be somewhat less. It is recommended that the lagging be designed for the full design pressure but be limited to a maximum of 400 pounds per square foot.

Water should not be allowed to pond on top of the excavation nor to flow towards it. A representative from our office should be present during the process of slot cutting and/or compaction.

Upon drilling and cast in place concrete pour, the proposed excavation can be achieved. The piles can be placed within the property lines at the east and west portions along the cast in place shoring piles. The distance between the shoring devices (piles) and proposed basement walls will be enough to install the backdrain and/or water proofing system.

3.9 Slabs-on-grade

Slabs-on-grade should be a minimum of 5 inches thick. Slab areas that are to be carpeted or tiled, or where the intrusion of moisture is objectionable, should be underlain by a moisture barrier consisting of 10-mil Visqueen, properly protected from puncture by 3 inches of sand above and below.

3.10 Reinforcement

Observation and classification of soil samples recovered from the site indicate the potential for expansion is low at surficial soils. Based on this, footings should include a minimum of two No.5 steel bars, placed at the top and two No.5 bars at the bottom, and slabs should have No. 3 rebars properly located at the center of the thickness. Expansive properties of soils should be verified upon completion of any grading or soil removal.

3.11 On-site Infiltration Testing

On January 7, 2022, one single wall AKA infiltration testing was performed at the designated areas by the project Civil Engineer. The test was performed in accordance with project Civil Engineer design criteria concerning the location and approximate depth.

The infiltration rate ratio in accordance with the testing method and calculation indicated that the infiltration is feasible at the subject site subject to to considering that liquefaction potential is not exists at the site. The infiltration rate at the boring having 10 feet depth is in excess of 14 inches per hour without including the factor of safety. The rate of infiltration including the factor of safety will be in the order of 4.8 inches per hour at 5 feet or a deeper elevation.

3.12 Observation and Testing

All grading and earthwork including trench backfill should be performed under the observation and testing of the consulting engineer for proper sub-grade preparation, selection of satisfactory materials, placement and compaction of all structural fill. Sufficient notification prior to stripping and earthwork construction is essential in order that the work will be adequately observed and tested.

Prior to initiation of grading, a meeting should be arranged by the developer and should be attended by representatives of the governmental agencies, contractors, consultants and the developer. Construction should be inspected at the following stages by the Geotechnical Consultant.

APPENDIX A

Field Exploration

Log of Sub-surface Exploration

B-1

Equipment Type: SMC		Boring # B-1
Diameter: 4"	Logged by: Y.K.	Date:1-20-07
Depth: 12 feet	G.water: - feet	Backfilled:Y

Std. Pen / Bulk/Bag / Ring / Elev. (feet)	Drive Wt: Drop: C/S N	USCS Letter / Graphic / Laboratory Moisture	Dry Reading	Graphic	USCS	Description of Earth Materials
		8.6	110.6		SM	Brown, light brown to gray, fine to coarse grained silty sand, dense and damp.
5		7.0	118.1			
10					SW	Light brown, fine to coarse grained sand and gravel (DG) with some silty matrix. Dense and damp.
15						End of subsurface exploration 12 feet. No perched water was encountered. Hard to refusal materials were encountered at -9 feet and below.
20						
25						
30						
35						
40						

Log depicts conditions at the time and location drilled.

Soil Pacific Inc.

Geotechnical and Environmental Services

Project Name: NE Corner of 6th Street and Promenade Ave, Corona

Project Number: A-3388-07

Report Date:

Figure:

Log of Sub-surface Exploration

B-2

Std. Pen		Drive Wt:	USCS Letter		Equipment Type: SMC		Boring # B-2
Bulk/Bag		Drop:	Graphic		Diameter: 4"	Logged by: Y.K.	Date:1-20-07
Ring		C/S	Laboratory		Depth: 8 feet	G.water: - feet	Backfilled:Y
Elev. (feet)		N	Moisture	Dry Reading	**Description of Earth Materials**		

SM	Brown, light brown to gray, fine to coarse grained silty sand, dense and damp.
SW	Light brown, fine to coarse grained sand and gravel (DG) with some silty matrix. Dense and damp.
	End of subsurface exploration 8 feet. No perchedwater was encountered. Refusal materials were encountered at -8 feet.

Elevation scale: 5 – 10 – 15 – 20 – 25 – 30 – 35 – 40

Log depicts conditions at the time and location drilled.

Soil Pacific Inc.

Geotechnical and Environmental Services

Project Name: NE Corner of 6th Street and Promenade Ave, Corona

Project Number: A-3388-07

Report Date:

Figure:

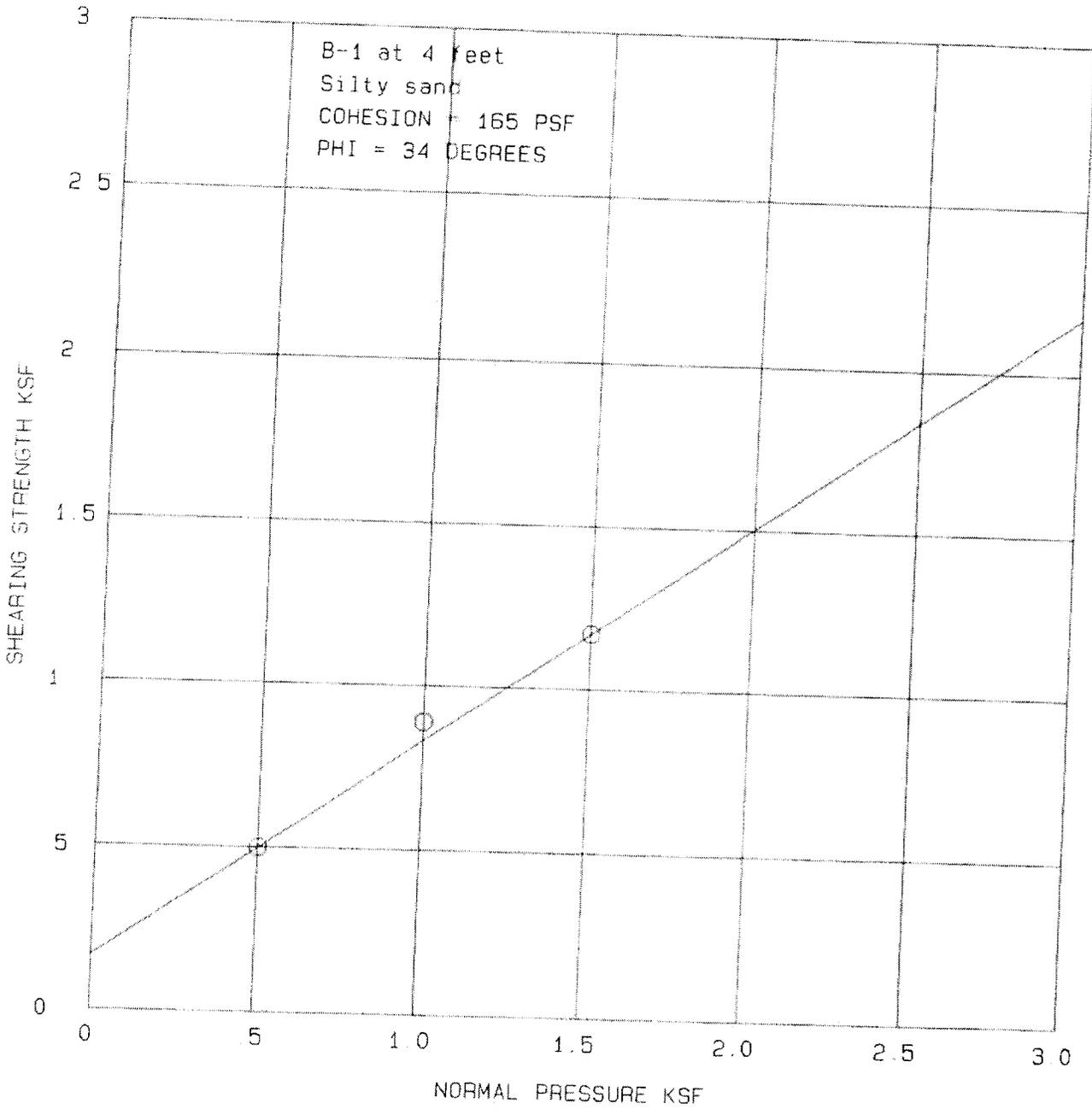# Log of Sub-surface Exploration

B-3

Std. Pen		Drive Wt:		USCS Letter			Equipment Type: SMC		Boring # B-3
Bulk/Bag		Drop:		Graphic			Diameter: 4"	Logged by: Y.K.	Date:1-20-07
Ring		C/S	Laboratory				Depth: 8 feet	G.water: - feet	Backfilled:Y
Elev. (feet)		N	Moisture	Dry Reading					

Description of Earth Materials

						SM	Brown, light brown to gray, fine to coarse grained silty sand, dense and damp.
5 —							
						SW	Light brown, fine to coarse grained sand and gravel (DG) with some silty matrix. Dense and damp.
10 —							
15 —							End of subsurface exploration 8 feet. No perchedwater was encountered. Refusal materials were encountered at -8 feet.
20 —							
25 —							
30 —							
35 —							
40 —							

Log depicts conditions at the time and location drilled.

Soil Pacific Inc.

Geotechnical and Environmental Services

Project Name: NE Corner of 6th Street and Promenade Ave, Corona

Project Number: A-3388-07

Report Date:

Figure:

Log of Sub-surface Exploration

B-4

Std. Pen		Drive Wt:		USCS Letter		Equipment Type: D-7700			Boring # B-4
Bulk/Bag		Drop:		Graphic		Diameter: 4"		Logged by: Y.K.	Date:12-21-08
Ring			C/S	Laboratory		Depth: 35 feet	G.water: 25feet		Backfilled:Y
Elev. (feet)		N		Moisture	Dry Reading	**Description of Earth Materials**			

Elev. (feet)	N	Moisture	Dry Reading	USCS	Description of Earth Materials
		9.0	113.6	SM / SW	Light brown, brown to gray fine to coarse grained silty sand with some gravel, damp and dry top soils.
5					
		7.6	119.2	SW	Light brown, fine to coarse grained silty sand with some gravel (DG), damp and dry, Native.
10					
		11.2	118.3	SW	
15				SW	
		12.2	112.4	SM	Gray, fine grained silty sand with some gravelly layers, damp and dense.
20					
25					
		18.8	110.2	ML	Ligth gray, gray fine grained silt with some sand wet to saturated.
30					
35		23.2	109.2		End of subsurface exploration 35 feet.
40					

Log depicts conditions at the time and location drilled.

Soil Pacific Inc.

Geotechnical and Environmental Services

Project Name: NE Corner of 6th and Promenade, Corona, California

Project Number: A-3388-07

Report Date:

Figure:

APPENDIX B

Laboratory

SHEAR TEST DIAGRAM

J.O. A-3390B-07

DATE 1-24-07

B-1 at 4 feet
Silty sand
COHESION = 165 PSF
PHI = 34 DEGREES

SHEARING STRENGTH KSF

NORMAL PRESSURE KSF

PLATE

APPENDIX

BEARING VALUE ANALYSIS

J.O. A-3390B-07

DATE 1-24-07

COHESION = 165 PSF   GAMA = 120 PCF   PHI = 34 DEGREES

DEPTH OF FOOTING = 1.5 FEET

BREADTH OF FOOTING = 1.25 FEET

FOOTING TYPE = CONTINUOUS

BEARING CAPACITY FACTORS

Nc = 42.2   Nq = 29.4   Ng = 34.4

FOOTING COEFFICIENTS

K1 = 1   K2 = .5

REFERENCE: TERZAGHI & PECK; 1967; 'SOIL MECHANICS
IN ENGINEERING PRACTICE'. PAGES 217 TO 225.

FORMULA

ULIMATE BEARING = (K1 * Nc * C) + (K2 * GA * Ng * B) + (Nq * GA * O) = 14834.5

ALLOWABLE BEARING = ULTIMATE BEARING = 4944.8
                                                3

THE ALLOWABLE BEARING VALUE SHOULD NOT EXCEED
4944.8 PSF. DESIGN SHOULD CONSIDER EXPANSION INDEX.

PLATE

APPENDIX

BEARING VALUE ANALYSIS

J.O. A-3390B-07

DATE 1-24-07

COHESION = 165 PSF   GAMA = 120 PCF   PHI = 34 DEGREES

DEPTH OF FOOTING = 2 FEET

BREADTH OF FOOTING = 2 FEET

FOOTING TYPE = SQUARE

BEARING CAPACITY FACTORS

Nc = 42.2   Nq = 29.4   Ng = 34.4

FOOTING COEFFICIENTS

K1 = 1.2   K2 = .4

REFERENCE. TERZAGHI & PECK. 1967 'SOIL MECHANICS
IN ENGINEERING PRACTICE'. PAGES 217 TO 225.

FORMULA

ULIMATE BEARING = (K1 * Nc * C) + (K2 * GA * Ng * B) + (Nq * GA * D) = 18714.2

ALLOWABLE BEARING = ULTIMATE BEARING = 6238.1
                                3

THE ALLOWABLE BEARING VALUE SHOULD NOT EXCEED
6238.1 PSF DESIGN SHOULD CONSIDER EXPANSION INDEX.

APPENDIX

TEMPORARY BACKCUT STABILITY

J.O A-3390B-07

DATE 1-24-07

COHESION = 165 PSF   GAMA = 120 PCF   PHI = 34 DEGREES

CUT HEIGHT = 4 FEET

SOIL TYPE = Silty sand

BACKFILL ASSUMED TO BE LEVEL

PORE PRESSURE NOT CONSIDERED

FORMULA

$$\text{SAFETY FACTOR} = \frac{(C \times L) + (GA \times AREA \times COS(Z) \times TAN(PHI))}{GA \times AREA \times SIN(Z)} = 2.02$$

$$Z = 45 + (PHI/2)$$

SINCE THE SAFETY FACTOR OF 2.02 IS GREATER THAN THE REQUIRED 1.25, THE TEMPORARY EXCAVATION IS CONSIDERED TO BE STABLE. THIS IS WITH A LEVEL AREA EQUAL TO THE LENGTH OF THE VERTICAL CUT ABOVE THE CUT.

PLATE

Porchet Method, Aka Inverse Borehole Method P-2

$\Delta T := 22$ Time Interval 10 Minutes

$D0 := 5$ Initial Depth to Water, (inch)

$Df := 120$ Final Depth to Water, (inch)

$Dr := 120$ Total Depth of the Test Hole

$r := 5.5$ Test Hole Redius, Inch

$H0 := Dr - D0$ Initial height of water at the selected time interval

$H0 = 115$

$Hf := Dr - Df$ Final height of water at the selected time interval

$Hf = 0$

$\Delta H := H0 - Hf$ $\Delta H = \Delta D$ Change in height over the time interval

$\Delta H = 115$

$Havg := \dfrac{(H0 + Hf)}{2}$

$Havg = 57.5$

The Conversion Equation is used:

$IR := \dfrac{\Delta H \cdot (60 \cdot r)}{\Delta T \cdot (r + 2Havg)}$

$IR = 14.315$ inch /Hour   Infiltration rate without including factor of safety

Factor of safety 3

$IRsafe := \dfrac{IR}{3}$ $IRsafe := 4.8$ Design rate inches/hour

APPENDIX C

References
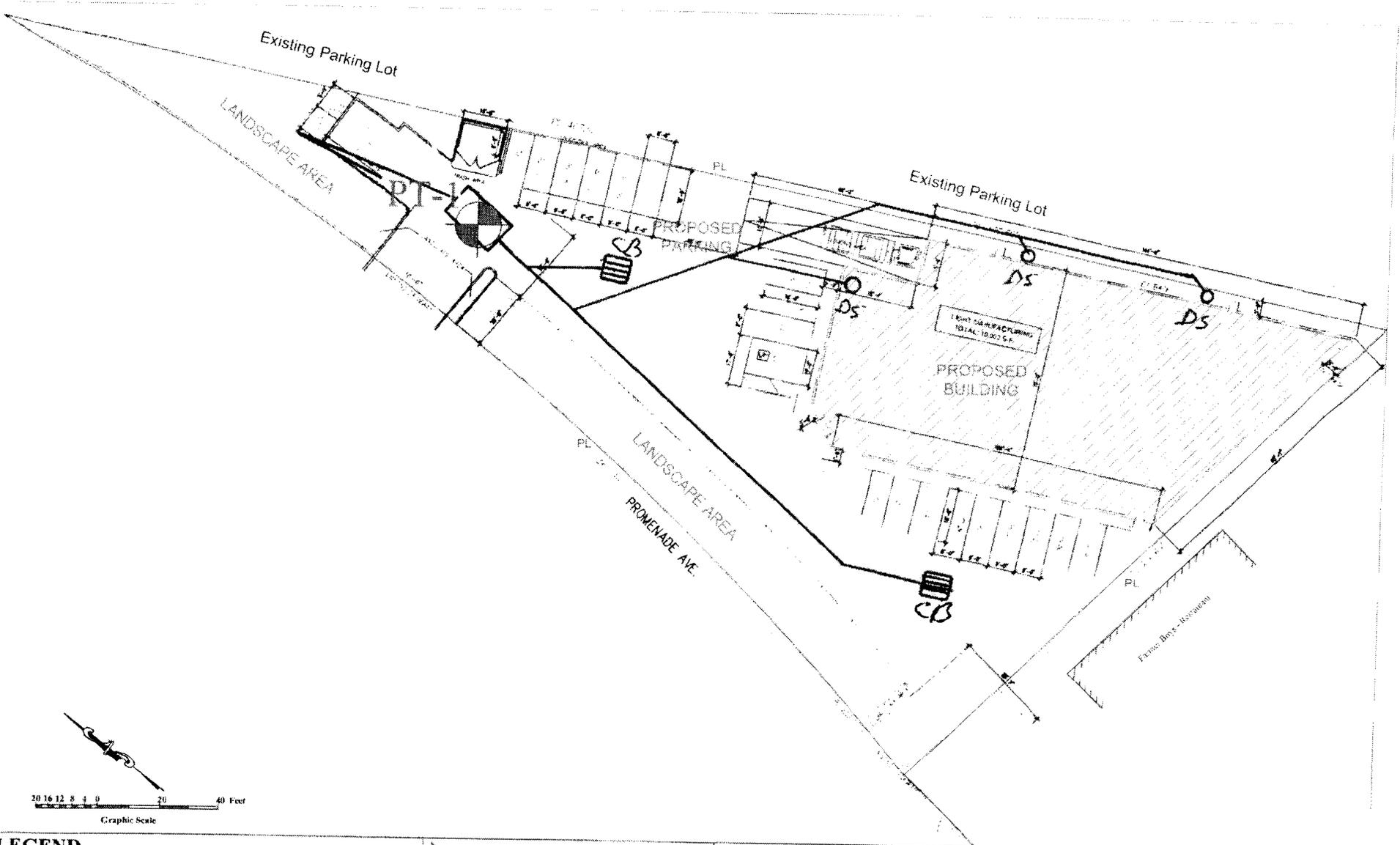
Existing Parking Lot

LANDSCAPE AREA

PT-1

Existing Parking Lot

PROPOSED PARKING

CB

DS

DS

DS

LIGHT MANUFACTURING
TOTAL 18,302 S.F.

PROPOSED
BUILDING

PL

LANDSCAPE AREA

PROMENADE AVE.

CB

PL

Future Boys Restaurant

20 16 12 8 4 0   20   40 Feet

Graphic Scale

soil PACIFIC Inc.
Geotechnical & Environmental Services

675 N. Eckhoff, Suite # A
Orange, CA 92868

Project Location:
NE Corner of 6th St. and
Promenade Ave., Corona.CA

GEOTECHNICAL PLAN

FIGURE-A-1-1	PROJECT NO.:A-3388P-22
DATE :01/07/2022	SCALE: 1"=30'

Vacant Land

B-3

○

B-1

○

B-2

○

Resturant
(Commercial
Property)
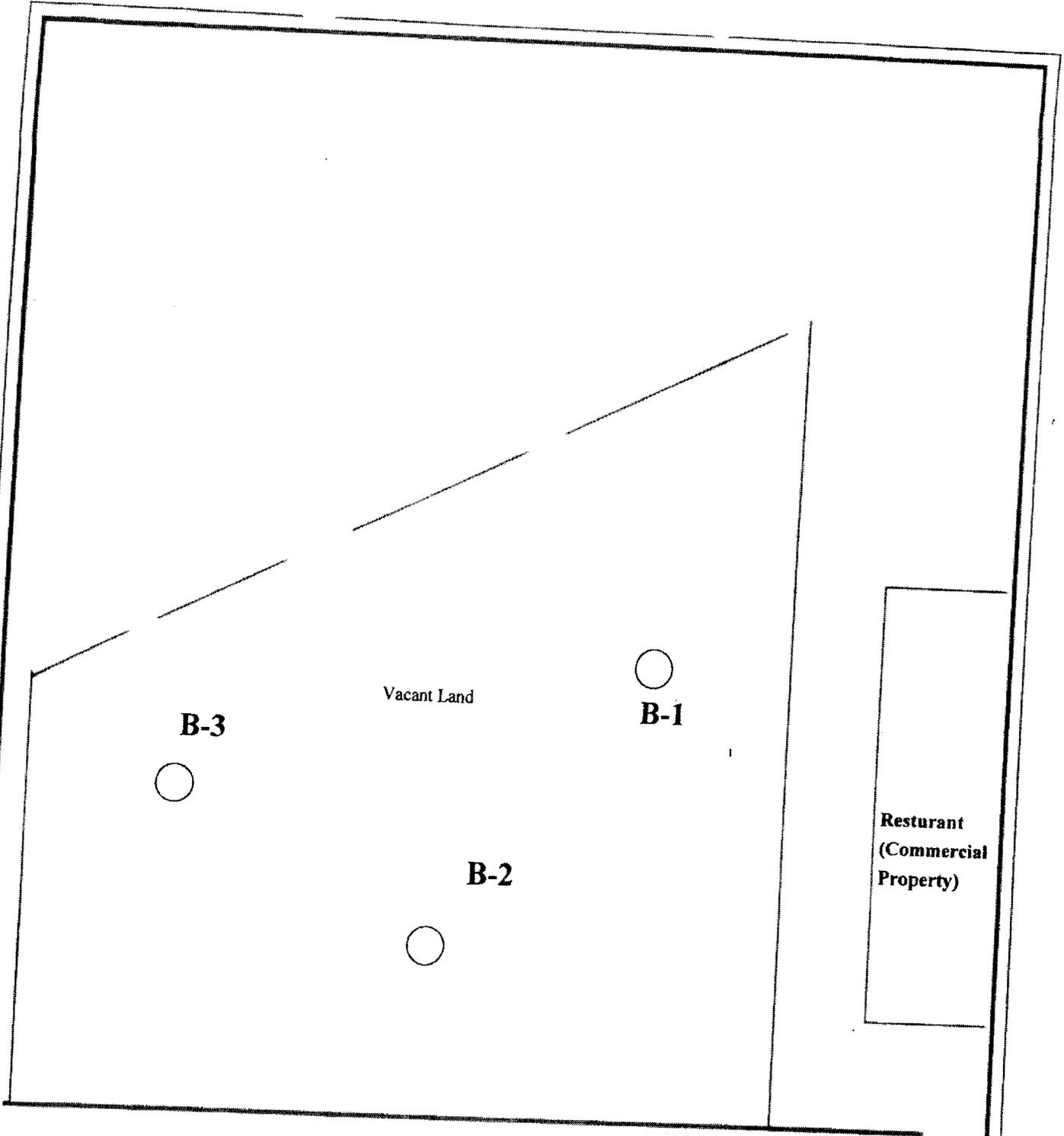
not to scale

Promenade Avenue

Layout Plan:	Promenade Avenue, Corona, California	
Soil PACIFIC Inc.	**Date: January 2007**	A-3390B-07
Tel. 714/ 879 1203 Fax. 714/ 879 48 12	**Plate No.: A-1-1**	

ASCE 7 Hazards Report

![ASCE - American Society of Civil Engineers]

Address:
1625 E 6th St
Corona, California
92879

Standard: ASCE/SEI 7-22
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 652.25 ft (NAVD 88)
Latitude: 33.874087
Longitude: -117.531595
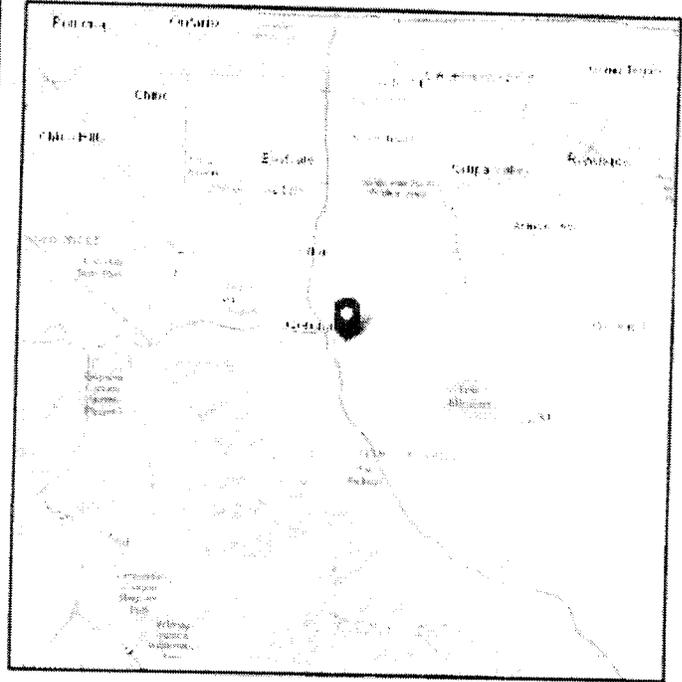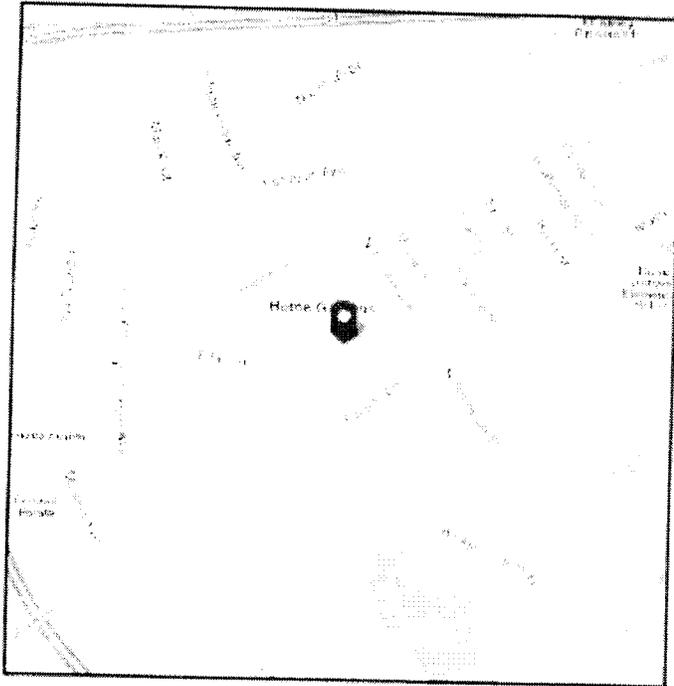
Site Soil Class:
Results:

PGA_M :	0.65	T_L :	8	
S_{MS} :	1.8	S_S :	1.82	
S_{M1} :	1.6	S_1 :	0.65	
S_{DS} :	1.2	S_{DC} :		
S_{D1} :	1.07	V_{S30} :	260	

Multi-Period MCE$_R$ Spectrum

$S_a(g)$ vs $T(s)$

Multi-Period Design Spectrum

$S_a(g)$ vs $T(s)$

Two-Period MCE$_R$ Spectrum

$S_a(g)$ vs $T(s)$

Two-Period Design Spectrum

$S_a(g)$ vs $T(s)$
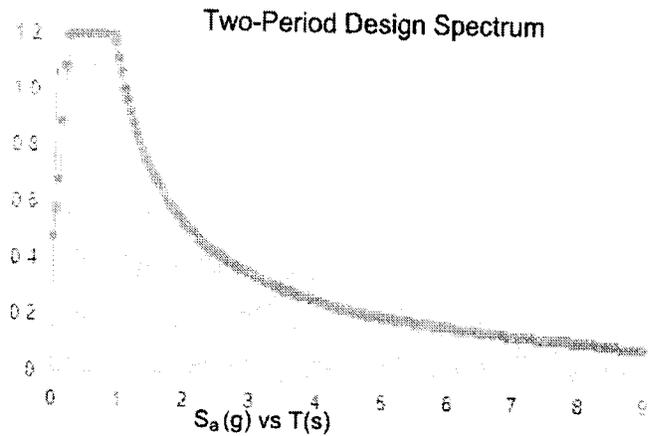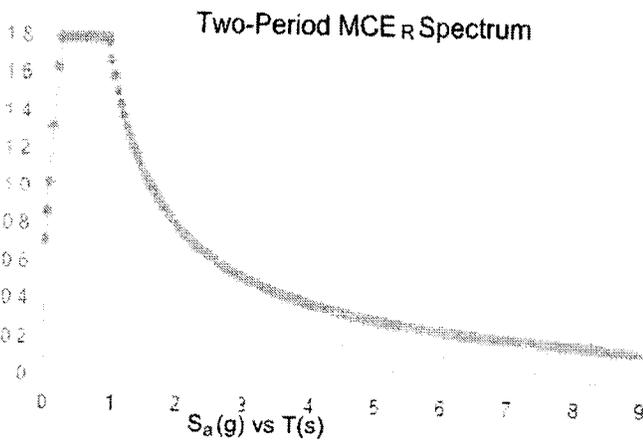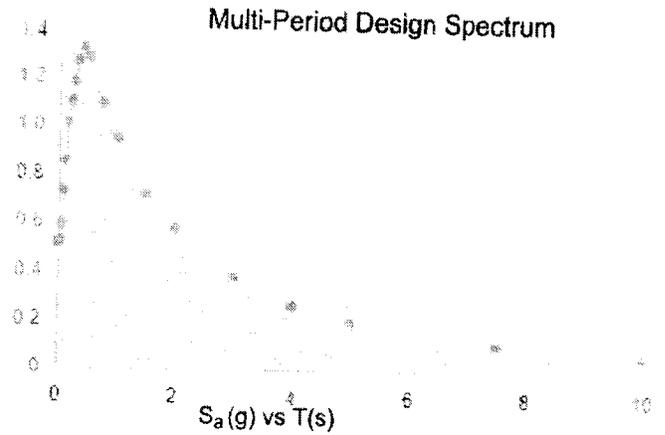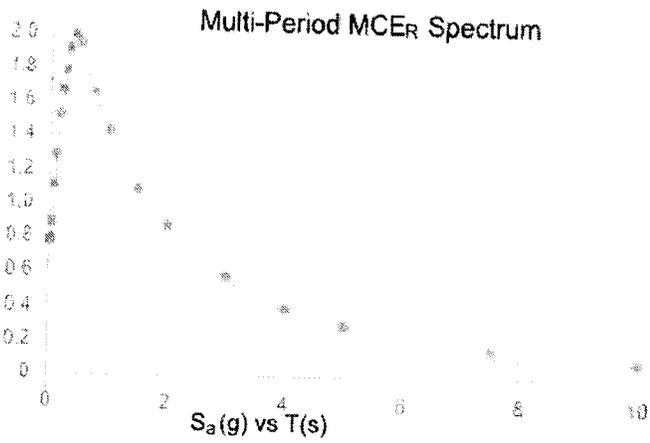
MCE$_R$ Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Data Accessed: Wed Jan 19 2022

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-22 and ASCE/SEI 7-22 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-22 Ch. 21 are available from USGS.